

Abstract Submitted  
for the DAMOP20 Meeting of  
The American Physical Society

**Quantum Gases on the ISS Capabilities of the BECCAL facility<sup>1</sup>**

LISA WOERNER, DLR, CHRISTIAN SCHUBERT, LUH DLR, JENS GROSSE, CLAUS BRAXMAIER, UBrem DLR, ERNST RASEL, LUH DLR, WOLFGANG SCHLEICH, UUlm DLR, BECCAL COLLABORATION — BECCAL (Bose-Einstein Condensate and Cold Atom Laboratory) is a NASA DLR mission dedicated to executing experiments with ultra-cold and condensed atoms on the International Space Station (ISS). BECCAL builds on the heritage of successful operation of atom optical experiments in microgravity, especially NASAs CAL and the DLR funded QUANTUS program, covering experiments in the drop tower and on sounding rockets (MAIUS). CAL, installed on the ISS in 2018, offers experimental time to interested researchers for a variety of experimental campaigns. It is therefore an important milestone towards the realization of BECCAL. BECCALs main objective is to enable a broad range of experiments, covering atom interferometry, coherent atom optics, scalar Bose-Einstein gases, spinor Bose-Einstein gases and gas mixtures, strongly interacting gases, and quantum information. Thus, BECCAL is a unique multi-user facility for performing fundamental research in the microgravity environment of the ISS. In addition, it is a pathfinder for future quantum sensors on ground and in space. With this contribution we will present the capabilities of the facility and promote the involvement of the scientific community to develop and execute experiments with this unique instrument.

<sup>1</sup>BECCAL is supported by DLR with funds provided by BMWi under Grants Nos. 50WP1700-1706.

Lisa Woerner  
German Aerospace Center (DLR)

Date submitted: 31 Jan 2020

Electronic form version 1.4